



Role of Specification in Simulation Component Reuse

Dale K. Pace

The Johns Hopkins University Applied Physics Laboratory

11100 Johns Hopkins Road

Laurel, Maryland 20723-6099

(240) 228-5650; (240) 228-5910 (FAX)

dale.pace@jhuapl.edu

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Background

Objective: To determine the impact of specification on potential for simulation component reuse

Specification: Any form of guidance or direction related to simulation development

Basis: review of formal & informal literature

drew upon half-dozen case studies

*2 anonymous, software factories, std sim use
(EADSIM/PAC-3), CMMS*

Principal Investigators: Dale Pace & Michael McPherson

Reuse DMSO CHRIS 19 Jun 2001 --
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Why Strive for Reuse

Purported Reuse Benefits:

- **Lower Cost**
- **More Rapid Development**
- **Higher Quality (fewer defects)**

Observations:

- **Effective reuse has major admin implications, and reuse may not result in cheaper, better, faster**
- **Cost-benefit of reuse is still debated**
- **Reuse can be inappropriate & may stifle innovation**



Reuse Cost

Reliable empirical reuse cost data is scanty:

successes only partially report costs; failures unreported

Rules of Thumb (from software reuse):

Cost to reuse -- no modifications (10-25% of development)

AND 10% will fail to compile!

Prep of software for reuse increases cost 35-50%

***Rule of Three:* Need at least 3 reuses to break even**

3 failed tries with cost for reuse, forget



Specification & Reuse

Potentially reusable assets include:

**knowledge/experience, requirements,
tools, test data, test plans,
designs/architectures, programs/code**

**More benefit seems to derive from reuse of
higher abstraction items and smaller assets
are easier to reuse than large ones**

**Effective reuse can be facilitated by
specifications that are:**

- clear and comprehensive**
- correct**
- consistent and coherent**



Conclusion

Effective reuse is most likely in quality development environment => first get quality process, then reuse

Beware of misuse potential in reuse

(including accommodating M&S requirements to capabilities of reuse component)

Emphasize higher abstraction assets for reuse

Share experience so that adequate